Investigation on the effect of sample preparation on the performance of thermochromic liquid crystal

ABSTRACT

This paper discussed the effect of sample mixture preparation on the performance of Thermochromic Liquid Crystals (TLCs) in terms of maximum intensity, hue sensitivity and aging effect. Three type of TLC mixtures were prepared; (A) solely TLC aqueous slurry solution, (B) TLC aqueous slurry solution and aqueous binder with a ratio of mixing of 3:1, and (C) TLC aqueous slurry solution, an aqueous binder, and tap water with a ratio of 5:1:6. The result obtained shows that sample A gives a higher maximum intensity values compared to the others. Furthermore, sample A with only TLC solution has better hue sensitivity at the red color region. As it goes to the green color region, the sample C, has the highest sensitivity due to the anchoring force present among the molecules. In term of resistance to aging effect, sample B and C that been mixed with other composition are having better resistance towards the effect as it been provided with extra shield resulted from the microencapsulation with aqueous binder. To sum up the result, sample mixing method has significant effect on the performance of the TLCs. The usage of solely of TLC without another additional compound may give higher maximum intensity and sensitivity on certain region but it will have low resistance towards the aging effect.

Keyword: Thermochromic liquid crystal; Thermography; Temperature sensing